REMARKS/ARGUMENTS

Favorable reconsideration of this application as presently amended and in light of the following discussion is respectfully requested.

Claims 1-4 and 26-37 are presently active; Claims 5-25 have been withdrawn by a Restriction Requirement, Claims 1-2 have been presently amended. No new matter has been added.

In the outstanding Office Action, Claims 1, 26-27, and 30-33 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tori et al (U.S. Pat. No. 5,755,888) in view of Ozawa et al (U.S. Pat. No. 6,305,895). Claims 2-5, 28-29, and 34-37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Tori et al and Ozawa et al in view of Iwasaki et al (U.S. Pat. No. 5,174,881).

Claim Summary: Claim 1 recites:

> A processed object processing apparatus that processes objects to be processed, comprising:
>
> first and second treatment chambers that are communicably and adjacently connected to each other and in which the objects to be processed are processed;
>
> one load lock chamber that is communicably and adjacently connected to said second treatment chamber, said one load lock chamber having a transfer arm located therein that transfers the objects to be processed into and out of each of said first and second treatment chambers, and having a processed object holding part holding the object to be processed;
>
> ***a first gate valve that isolates interiors of said first and second treatment chambers from an ambient atmosphere; and***
>
> ***a second gate valve that isolates interiors of said second treatment chamber and said one load lock chamber from the ambient atmosphere***;
>
> wherein said second treatment chamber is a vacuum treatment chamber which drives products off from the objects to be processed, and said one load lock chamber and said first and second treatment chambers are aligned in the same straight line,
>
> wherein the transfer arm is capable of entering into both said first and second treatment chambers such that the transfer arm can transfer directly the object to be processed to said first and second treatment chambers,
>
> ***wherein said first gate valve is opened so as to communicate said first and second treatment chambers with each other once a pressure inside said***

first treatment chamber has become more than a pressure inside said second treatment chamber, and

wherein said second gate valve is opened so as to communicate said one load lock chamber and said second treatment chamber with each other once a pressure inside said one load lock chamber has become more than the pressure inside said second treatment chamber. [Emphasis added.]

Claim 2 recites:

A processed object processing apparatus that processes objects to be processed, comprising:

a COR (chemical oxide removal) treatment chamber in which the objects to be processed are subjected to COR treatment;

a vacuum treatment chamber which drives products off from the objects to be processed, said COR treatment chamber and said vacuum treatment chamber being communicably and adjacently connected to each other;

one load lock chamber that is communicably and adjacently connected to vacuum treatment chamber, said one load lock chamber having a transfer arm located therein that transfers the objects to be processed into and out of each of said COR treatment chamber and said vacuum treatment chamber, and having a processed object holding part holding the object to be processed,

a first gate valve that isolates interiors of said COR treatment chamber and said vacuum treatment chamber from an ambient atmosphere; and

a second gate valve that isolates interiors of said second vacuum treatment chamber and said one load lock chamber from the ambient atmosphere;

wherein said one load lock chamber, said COR treatment chamber and said vacuum treatment chamber are aligned in the same straight line,

wherein the transfer arm is capable of entering into both said COR treatment chamber and said vacuum treatment chamber such that the transfer arm can transfer directly the object to be processed to said COR treatment chamber and said vacuum treatment chamber,

wherein said first gate valve is opened so as to communicate said COR and vacuum treatment chambers with each other once a pressure inside said COR treatment chamber has become more than a pressure inside said vacuum treatment chamber, and

wherein said second gate valve is opened so as to communicate said one load lock chamber and said vacuum treatment chamber with each other once a pressure inside said one load lock chamber has become more than the pressure inside said vacuum treatment chamber. [Emphasis added.][1]

[1] The emphasized features are supported in Applicants' Figures 1 and 2, the operational discussion on pages 29-31 and 36-39 of Applicants' specification, and the timing chart in Applicants' Figure 5 (discussed at pages 41-43 of Applicants' specification.

Regarding the rejection on the merits:

According to amended Claim 1, the first gate valve isolates the interiors of the first and second treatment chambers from the ambient atmosphere and is opened so as to communicate the first and second treatment chambers with each other once the pressure inside the first treatment chamber has become more than the pressure inside the second treatment chamber. The second gate valve isolates the interiors of the second treatment chamber and the one load lock chamber from the ambient atmosphere, and is opened so as to communicate the one load lock chamber and the second treatment chamber with each other once the pressure inside the one load lock chamber has become more than the pressure inside the second treatment chamber.

Moreover, in Claim 2, the first gate valve isolates interiors of the COR treatment chamber and the vacuum treatment chamber from the ambient atmosphere, and is opened so as to communicate the COR and vacuum treatment chambers with each other once the pressure inside the COR treatment chamber has become more than the pressure inside the vacuum treatment chamber. The second gate valve isolates interiors of the vacuum treatment chamber and the one load lock chamber from the ambient atmosphere, and is opened so as to communicate the one load lock chamber and the vacuum treatment chamber with each other once the pressure inside the one load lock chamber has become more than the pressure inside the vacuum treatment chamber.

Accordingly, the examiner will appreciate that these features in Claims 1 and 2 can provide special effects in that products driven off can be prevented from flowing into the load lock chamber and the first treatment chamber (or the COR treatment chamber) so that the products driven off do not contaminate components in the load lock chamber and the first treatment chamber (or the COR treatment chamber).

Tori et al describe an apparatus of forming thin films. The apparatus includes a physical vapor deposition device 3, a chemical vapor deposition device 4 and a substrate transfer system 9. The physical vapor deposition device 3, the chemical vapor deposition device 4 and the substrate transfer system 9 are aligned in a straight line (see Figs. 3 and 4). In Tori et al, a lower electrode 59 was formed inside the rf magnetron sputtering device 3 on a silicon substrate 54, and then the silicon substrate 54 was forwarded to the side of the plasma chemical vapor deposition device 4 through the substrate transfer passage 8 by the substrate transfer system 9 (see col. 6, lines 20 to 28).

However, Tori et al neither disclose nor suggest pressure conditions in interiors of the rf magnetron sputtering device 3 and the chemical vapor deposition device 4 at the time of opening a switch valve 7 connected between the rf magnetron sputtering device 3 and the plasma chemical vapor deposition device 4.

The deficiencies in Tori et al are not overcome by Ozawa et al and Iwasaki et al.

Ozawa et al describe disposing a transfer arm for delivering a semiconductor wafer from a clean room to a process chamber for carrying out a predetermined process in a load-lock chamber of a semiconductor process equipment (see col. 1, lines 14 to 37). However, Ozawa et al neither disclose nor suggest pressure conditions in interiors of the load-lock chamber and the process chamber at the time of opening process-chamber-side gate valve 26 provided between the load-lock chamber and the process chamber.

Iwasaki et al describe a pretreatment chamber 37 for chemical oxidation and a chamber for forming film 38 evacuated to a high vacuum state (see Fig. 11). However, Iwasaki et al neither disclose nor suggest pressure conditions in interiors of the pretreatment chamber 37 and the chamber for forming film 38 at the time of opening lock valve 21b provided between the pretreatment chamber 37 and the chamber for forming film 38.

As discussed above, Tori et al, Ozawa et al and Iwasaki et al neither disclose nor suggest the features presently defined in Claims 1 and 2. Therefore, independent Claims 1 and 2 are believed to be patentable over Tori et al, Ozawa et al and Iwasaki et al, singly or in combination.

Since M.P.E.P. § 2143.03 requires that all words in a claim must be considered in judging the patentability of the claim against the prior art, Claims 1 and 2 as amended (and the claims dependent therefrom) are believed to patentably define over Futagawa et al and Iwasaki et al.

Consequently, in view of the present amendment and in light of the above discussions, the outstanding grounds for rejection are believed to have been overcome. The application as amended herewith is believed to be in condition for formal allowance. An early and favorable action to that effect is respectfully requested.

Respectfully submitted,

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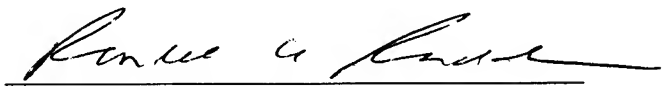

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